

MEAP

**MICHIGAN
EDUCATIONAL
ASSESSMENT
PROGRAM**

**Grade 8
Mathematics**

Released Items

Winter 2003

28 (4 Points)

Bruce is looking for the least expensive phone service. Companies A and B each charge different rates based on the length of the call. The tables show the lengths of various calls and the cost of each call for the two companies.

Company A	
Time (minutes)	Cost (dollars)
1	0.10
5	0.50
15	1.50
25	2.50

Company B	
Time (minutes)	Cost (dollars)
1	0.25
2	0.30
10	0.70
12	0.80

ANSWER THIS ITEM IN YOUR ANSWER FOLDER.

SHOW ALL YOUR WORK IN YOUR ANSWER FOLDER.

Scoring Rubric for Item 28

A **4-point** response includes all of the following components:

- Determines company A's plan is most economical for 1 **OR** 2 minute calls.
- Gives a clear, complete explanation to support the answer. For example:

	Company A	Company B
1 minute call	\$0.10	\$0.25

OR

2 minute call	\$0.20	\$0.30
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- Determines company B's plan is most economical for 10-15 minute calls.
- Gives a clear, complete explanation to support the answer. For example:

	Company A	Company B
10 minute call	\$1.00	\$0.70

OR

15 minute call	\$1.50	\$0.95
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NOTE: The explanation needs to indicate that the student understands the rates *across* the 1 to 2 and/or the 10 to 15 minute intervals *in comparison of the two companies*, rather than at just one specific amount of time for one specific company (e.g. Company A is more economical for 1 minute calls because it is \$0.10 a minute).

A **3-point** response provides three of the elements in a 4-point response.

A **2-point** response provides two of the elements in a 4-point response.

A **1-point** response provides one of the elements in a 4-point response.

A 0-point response provides none of the elements in a 4-point response.

4 points

28 Complete the following 2 parts

- a. Which company plan is more economical if Bruce usually makes 1 or 2 minute calls?
Explain your answer.

Company B would be, 25 for 1 minute calls and 30[¢] for 2 minute calls. because you aint on the phone that long and it's cheper time

- b. Which company plan is more economical if Bruce usually makes 10-15 minute calls?
Explain your answer.

Company A would be better because if your on the phone that long it goes up so 1.50 I would pay.

Score point: 0

This response demonstrates no understanding of the item being tested.

4 points

28 Complete the following 2 parts

- a. Which company plan is more economical if Bruce usually makes 1 or 2 minute calls?
Explain your answer.

- b. Which company plan is more economical if Bruce usually makes 10-15 minute calls?
Explain your answer.

b. Company B has less Time (minuted) than (Cost dollars) for Company A.

Score point: 1

This response correctly identifies Company B for 10-15 minute calls without an acceptable explanation.

4 points

28 Complete the following 2 parts

- a. Which company plan is more economical if Bruce usually makes 1 or 2 minute calls?
Explain your answer.

A.) I think plan A is best for making 1-2 min calls because it only costs 10¢ per minute.

- b. Which company plan is more economical if Bruce usually makes 10-15 minute calls?
Explain your answer.

B.) I think company B would be the best for 10-15 mins because it hops all around for the price but for 10 minutes it only costs 70¢ and for 12 minutes it only costs 80¢.

Score point: 2

This response correctly identifies Company A for 1-2 minute calls without an acceptable explanation, and Company B for 10-15 minute calls without an acceptable explanation.

4 points

28 Complete the following 2 parts

- a. Which company plan is more economical if Bruce usually makes 1 or 2 minute calls?
Explain your answer.

Company A is more economical if he only makes 1 or 2 minute calls because only be spending 10¢ or 20¢ per call

- b. Which company plan is more economical if Bruce usually makes 10-15 minute calls?
Explain your answer.

Company B is more economical 10 or 15 minute calls because for 10 min. calls on plan A. would be \$1.00 but for plan B. it is 70¢.

Score point: 3

This response correctly identifies Company A for 1-2 minute calls, but without an acceptable explanation, and Company B for 10-15 minute calls, with an acceptable explanation (10 min. calls on plan A would be \$1.00 but for B it is \$0.70).

4 points

28 Complete the following 2 parts

- a. Which company plan is more economical if Bruce usually makes 1 or 2 minute calls?
Explain your answer.

a.) Company A's plan is more economical if Bruce usually makes 1 or 2 minute calls, because for each minute called in Company A they charge you 10¢; for company B it is 25¢ a minute and adds 5 cents a minute after that.

✓	Company A	Company B
	1 min 10¢	1 min 25¢
	2 min 20¢	2 min 30¢

- b. Which company plan is more economical if Bruce usually makes 10-15 minute calls?
Explain your answer.

b.) Company B's plan is more economical if Bruce usually makes 10-15 minute calls, because Company B charges 25¢ for the first minute but after that it is only 5¢ a minute. On the other hand, Company A charges 10¢ a minute.

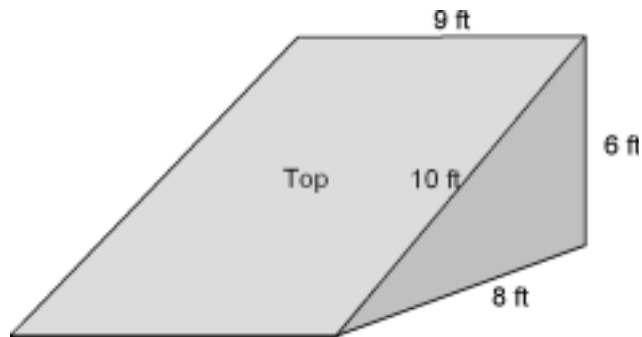
Company A	✓ Company B
10 min 1.00	10 min 0.70
15 min 1.50	15 min 0.95

Score point: 4

This response correctly identifies Company A for 1-2 minute calls with a complete explanation (Company A: 1 min/2 min = 10¢/20¢ and Company B: 1 min/2 min = 25¢/30¢), and Company B for 10-15 minute calls with a complete explanation (Company A: 10 min/15 min = 1.00/1.50 and B: 10 min/15 min = 0.70/0.95).

42 (4 Points)

Chan and Aida built this skateboard ramp.



Chan's father offered to buy the paint for the 3 sides and the top of the ramp. One gallon of paint covers an area of 50 sq ft.

ANSWER THIS ITEM IN YOUR ANSWER FOLDER.

SHOW ALL YOUR WORK IN YOUR ANSWER FOLDER.

Scoring Rubric for Item 42

Student responses should have the following components with the indicated value points:

A. 4 value points = Provides the correct measurements for the top of the ramp **AND** three sides in any of the following combinations (each measurement is worth 1 value point):

- 90, 24, 24, 54
- 90, 48, 54
- 90, 102
- 192

* note: only 1 value point for the combination of 90, 48.

B. 2 value points = Correctly identifies the amount of paint needed as 5.64 or 6 gallons. **OR** Provides an amount based upon flawed measurements with work shown.

OR

1 value point = A conceptual error results in a wrong final answer. **OR** a correct answer of 6 but based upon flawed work.

*1 value point = **For Parts A and/or B**, must provide some relevant method or work.

*1 value point = **For Parts A and/or B**, correctly labels any of the given measurements in square feet.

Scoring Guide:

4 points = 8 value points

3 points = 6-7 value points

2 points = 3-4-5 value points

1 point = 1-2 value points

0 points = 0 value points

4 points

42 Complete the following 2 parts

- a. Find the area of the top and the 3 sides.

The Area is 47

- b. Chan and Aida decided to put 2 coats of paint on the top and one coat on each of the three sides. How many gallons of paint do they need?

The will need 2 gallons

Score point: 0

This response demonstrates no understanding of the item being tested.

4 points

42 Complete the following 2 parts

a. Find the area of the top and the 3 sides.

$$a. \quad A = \frac{1}{2} \text{ base height}$$

$$A = \frac{1}{2} \cdot 8 \cdot 9$$

$$A = 36 \text{ ft}^2$$

b. Chan and Aida decided to put 2 coats of paint on the top and one coat on each of the three sides. How many gallons of paint do they need?

$$b. \quad 180 \text{ ft}^2 \text{ for the top}$$

and

$$48 + 48 + 48$$

$$144 \text{ ft}^2 \text{ for the sides}$$

Score point: 1 (1-value point)

This response provides the correct label (ft^2).

4 points

42 Complete the following 2 parts

a. Find the area of the top and the 3 sides.

$$9 \cdot 10 = 90 \text{ ft}^2 = \text{top}$$
$$8 \cdot 6 = 48 \text{ ft}^2 = \text{side}$$

6 gallons of paint

b. Chan and Aida decided to put 2 coats of paint on the top and one coat on each of the three sides. How many gallons of paint do they need?

Score point: 2 (4-value points)

This response provides a correct measurement (90), some relevant work ($9 \cdot 10$), and the correct amount of paint (6).

4 points

42 Complete the following 2 parts

a. Find the area of the top and the 3 sides.

$$\begin{array}{rcl}
 \text{2.) side} & = & 6 \times 8 \div 2 = 24 \text{ ft}^2 \\
 \text{side} & = & 6 \times 8 \div 2 = 24 \text{ ft}^2 \\
 \text{side} & = & 9 \times 6 = 54 \text{ ft}^2 \\
 \text{top} & = & 10 \times 9 = 90 \text{ ft}^2
 \end{array}
 \quad
 \begin{array}{r}
 24 \\
 24 \\
 54 \\
 + 90 \\
 \hline
 192 \text{ ft}^2
 \end{array}$$

b. Chan and Aida decided to put 2 coats of paint on the top and one coat on each of the three sides. How many gallons of paint do they need?

b.) top = 90 ft but Chan and Aida want to put 2 coats of paint on the top so $90 \times 2 = 180 \text{ ft}^2$. They only want one coat of paint on all three sides so $24 + 24 + 24 = 72$. I added three 24's because there's three sides. Now, I add $180 + 72 = 252$. I know that 1 gallon of paint covers ^{which equals} 50 ft² so I take $252 \div 50$ which equals $5 \frac{1}{5}$. I would round up so $5 \frac{1}{5}$ rounds up to 6 gallons of paint.

6 gallons of paint

Score point: 3 (7-value points)

This response provides a correct measurement combination (192), some relevant work ($6 \times 8/2$), the correct label (ft²), and the correct amount of paint (6), but based upon flawed work ($180 + 72 = 252$).

4 points

42 Complete the following 2 parts

a. Find the area of the top and the 3 sides.

a.) To find the top you take 9×10 which is 90 ft, then for the sides you take 6×8 which is 48. and leave it because there are 2 equal sides & it therefore isn't necessary to \div by 2, then you take 9×6 which is 54 for the back side & add all together which is 192 ft.²

b. Chan and Aida decided to put 2 coats of paint on the top and one coat on each of the three sides. How many gallons of paint do they need?

b.) One gallon of paint covers 50 sq. ft. so to get the top you'd take the area of the top (which is 90 ft²) & multiply by 2 since there are going to be 2 coats of paint (which is 180 ft²) and divide it by 50 (because 50 sq. ft = 1 gallon) which is 3.6. 102 ft is the back & sides divided by 50 ft² is 2.04. Add 3.6 & 2.04 & you get 5.64 so you'd need 6 gallons.

Score point: 4 (8-value points)

This response provides a correct measurement combination (90, 48, 54), some relevant work (9×10), the correct label (ft²), and the correct amount of paint (5.64 or 6).